Technology Outreach: Personal Rover Project

The Personal Rover Project serves as an ideal outreach component for informal and formal learning environments in furthering NASA's goals to excite and inspire students regarding science and engineering.

Background

The Personal Exploration Rover (PER) is a miniature six-wheeled robot that gives visitors to Ames Research Center hands-on lessons in robotics and planetary exploration. The rover is among a fleet of 20 NASA-funded PERs that can be found in museums across the United States.

"With the Personal Exploration Rover, students can learn how robots interact with the world and see for themselves how the future might look as we have more and more robots helping us in our everyday life," said G. Scott Hubbard, director of NASA Ames Research Center.

Each rover is 1.2 feet tall, 10 pounds and can move 1.6 inches per second across a Mars yard in the museum. A visitor interacts with a PER by selecting a rock target that the rover's panoramic imager displays on a monitor. Then the tiny vehicle moves across the red landscape to reach the rock. Each rover's mobility system is similar to the Mars Exploration Rover Mission's Spirit and Opportunity.

Research Overview

Designed to teach and to encourage the development of low-cost robotic devices for use in education and at home, the PER project was first developed by researchers at Carnegie Mellon University with support from NASA and Intel Corp.

Ames robotics researcher Illah Nourbakhsh is an associate professor of robotics on leave at Carnegie Mellon's School of Computer Science. Nourbakhsh led the PER project while at Carnegie.
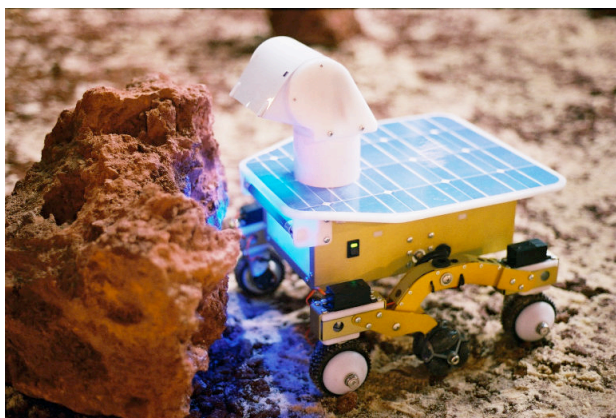
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"Our goal is to excite and inspire kids about science and technology and educate people about the role of rovers and rover autonomy in doing space science," Nourbakhsh said. "We want people to understand why it's important for the rovers to be smart."

The PER project is funded as part of a four-year grant from NASA to develop educational robots. It is supported through the NASA Ames Intelligent Systems Program and Intel. The PERs are powered by Intel Xscale technology using the Intel R PXA255 processors, which provide high system performance and low power consumption. The rovers run the Linux operating system and are programmed in Java.

Installations of the PER include the Smithsonian National Air and Space Museum, the Smithsonian Udvar-Hazy Center, the National Science Center, the San Francisco Exploratorium and the NASA/Ames Mars Center. Outreach activities include PER activities in England and Japan internationally.

Formal educational evaluation of the Personal Rover project's outreach efforts have resulted in two published journal articles (see website) and other publications that demonstration statistically significant learning across multiple age groups and both genders. Most significantly, this educational robotics program have been shown to engage and retain women in a technology outreach activity, even when they have an initial hesitation in comparison to men.

Relevance to Exploration Systems

Technology literacy and educational outreach is an important ingredient for successful NASA programs. The Personal Rover Project offers curriculum, informal and formal learning contacts and other resources that enable technology outreach hand-in-hand with research and development programs.

H&RT Program Elements:

This research capability supports all program elements by providing a venue for educational outreach programming using NASA/Ames Research Center competency and resources.

Points of Contact:

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